

## § 600.311-08

fuelconomy.gov.” For *x*, insert the vehicle’s composite CO<sub>2</sub> emission rate as described in § 600.311.

[76 FR 39563, July 6, 2011]

### § 600.311-08 Range of fuel economy for comparable automobiles.

(a) The Administrator will determine the range of combined fuel economy values for each class of comparable automobiles comprising the maximum and minimum combined fuel economy values for all general labels as determined in § 600.210-08(c).

(b)(1) The ranges for a model year will be made available on a date specified by the Administrator that closely coincides to the date of the general model introduction for the industry.

(2) If the Administrator has not made available the fuel economy ranges prior to the model introduction, the ranges from the previous model year must be used.

(3) For 2008 model year automobiles manufactured or imported prior to the date specified in § 600.306-08(b), the Administrator will provide initial fuel economy ranges based upon data from 2007 models that have been adjusted in accordance with the derived 5-cycle calculations in § 600.210-08.

(c) If the Administrator determines that automobiles intended for sale in California are likely to exhibit significant differences in fuel economy from those intended for sale in other states, he/she will compute separate ranges of fuel economy values for each class of automobiles for California and for the other states.

(d) For high altitude vehicles determined under § 600.310, both general and specific labels will contain the range of comparable fuel economy computed in this section.

(e) The manufacturer shall include the appropriate range of fuel economy determined by the Administrator in paragraph (b) of this section, on each label affixed to an automobile within the class, except as provided in § 600.306(b)(1).

[71 FR 77951, Dec. 27, 2006]

## 40 CFR Ch. I (7-1-12 Edition)

### § 600.311-12 Determination of values for fuel economy labels.

(a) *Fuel economy.* Determine city and highway fuel economy values as described in § 600.210-12(a) and (b). Determine combined fuel economy values as described in § 600.210-12(c). Note that the label for plug-in hybrid electric vehicles requires separate values for combined fuel economy for vehicle operation before and after the vehicle’s battery is fully discharged; we generally refer to these modes as “Blended Electric+Gas” (or “Electric Only”, as applicable) and “Gas only”.

(b) *CO<sub>2</sub> emission rate.* Determine the engine-related CO<sub>2</sub> emission rate as described in § 600.210-12(d).

(c) *Fuel consumption rate.* Calculate the fuel consumption rate as follows:

(1) For vehicles with engines that are not plug-in hybrid electric vehicles, calculate the fuel consumption rate in gallons per 100 miles (or gasoline gallon equivalent per 100 miles for fuels other than gasoline or diesel fuel) with the following formula, rounded to the first decimal place:

Fuel Consumption Rate = 100/MPG

Where:

MPG = The unrounded value for combined fuel economy from § 600.210-12(c).

(2) For plug-in hybrid electric vehicles, calculate two separate fuel consumption rates as follows:

(i) Calculate the fuel consumption rate based on engine operation after the battery is fully discharged as described in paragraph (c)(1) of this section.

(ii) Calculate the fuel consumption rate during operation before the battery is fully discharged in kW-hours per 100 miles as described in SAE J1711 (incorporated by reference in § 600.011), as described in § 600.116.

(3) For electric vehicles, calculate the fuel consumption rate in kW-hours per 100 miles with the following formula, rounded to the nearest whole number:

Fuel Consumption Rate = 100/MPG

Where:

MPG = The combined fuel economy value from paragraph (a) of this section, in miles per kW-hour.

(4) For hydrogen fuel cell vehicles, calculate the fuel consumption rate in kilograms of hydrogen per 100 miles with the following formula, rounded to the nearest whole number:

Fuel Consumption Rate = 100/MPG

Where:

MPG = The combined fuel economy value from paragraph (a) of this section, in miles per kilogram of hydrogen.

(d) *Fuel economy and greenhouse gas ratings.* Determine a vehicle's fuel economy and greenhouse gas ratings as follows:

(1) For gasoline-fueled vehicles that are not plug-in hybrid electric vehicles (including flexible fuel vehicles that operate on gasoline), establish a single rating based only on the vehicle's combined fuel economy from paragraph (a) of this section. For all other vehicles, establish a fuel economy rating based on the vehicle's combined fuel economy and establish a separate greenhouse gas rating based on combined CO<sub>2</sub> emission rates from paragraph (b) of this section.

(2) We will establish the fuel economy rating based on fuel consumption values specified in paragraph (c) of this section. We will establish the value dividing the 5 and 6 ratings based on the fuel consumption corresponding to the projected achieved Corporate Average Fuel Economy level for the applicable model year. This is intended to prevent below-average vehicles from getting an above-average fuel economy rating for the label. We will establish the remaining cutpoints based on a statistical evaluation of available information from the certification database for all model types. Specifically, the mean value plus two standard deviations will define the point between the 1 and 2 ratings. The mean value minus two standard deviations will define the point between the 9 and 10 ratings. The 1 rating will apply for any vehicle with higher fuel consumption rates than the 2 rating; similarly, the 10 rating will apply for any vehicle with lower fuel consumption rates than the 9 rating. We will calculate range values for the remaining intermediate ratings by dividing the range into equal intervals. We will convert the resulting range intervals to equivalent miles-per-gallon

values. We will define the greenhouse gas ratings by converting the values from the fuel economy rating intervals to equivalent CO<sub>2</sub> emission rates using the conventional conversion factor for gasoline (8887 g CO<sub>2</sub> per gallon of consumed fuel).

(e) *Annual fuel cost.* Calculate annual fuel costs as follows:

(1) Except as specified in paragraph (e)(3) of this section, calculate the total annual fuel cost with the following formula, rounded to nearest \$50:

Annual Fuel Cost = Fuel Price/MPG × Average Annual Miles

Where:

Fuel Price = The estimated fuel price provided by EPA for the type of fuel required for the vehicle. The units are dollars per gallon for gasoline and diesel fuel, dollars per gasoline gallon equivalent for natural gas, dollars per kW-hr for plug-in electricity, and dollars per kilogram of hydrogen for hydrogen fuel cell vehicles.

MPG = The combined fuel economy value from paragraph (a) of this section. The units are miles per gallon for gasoline and diesel fuel, miles per gasoline gallon equivalent for natural gas, miles per kW-hr for plug-in electricity, and miles per kilogram of hydrogen for hydrogen fuel cell vehicles.

Average Annual Miles = The estimated annual mileage figure provided by EPA, in miles.

(2) For dual fuel vehicles and flexible fuel vehicles, disregard operation on the alternative fuel.

(3) For plug-in hybrid electric vehicles, calculate annual fuel cost as described in this paragraph (e)(3). This description applies for vehicles whose engine starts only after the battery is fully discharged. Use good engineering judgment to extrapolate this for calculating annual fuel cost for vehicles that use combined power from the battery and the engine before the battery is fully discharged. Calculate annual fuel cost as follows:

(i) Determine the charge-depleting ranges for city and highway operation as described in paragraph (j)(4)(i) of this section. Adjust each of these values for 5-cycle operation.

(ii) Calculate multi-day individual utility factors (UF) as described in § 600.116 corresponding to the driving

ranges from paragraph (e)(3)(i) of this section.

(iii) Calculate values for the vehicle's average fuel economy over the charge-depleting range (in miles per kW-hr) for city and highway operation as described in § 600.210. Adjust each of these values for 5-cycle operation. Convert these to \$/mile values by dividing the appropriate fuel price from paragraph (e)(1) of this section by the average fuel economy determined in this paragraph (e)(3)(iii).

(iv) Calculate values for the vehicle's average fuel economy over the charge-sustaining range (in miles per gallon) for city and highway operation as described in § 600.210-12. Adjust each of these values for 5-cycle operation. Convert these to \$/mile values by dividing the appropriate fuel price from paragraph (e)(1) of this section by the average fuel economy determined in this paragraph (e)(3)(iv).

(v) Calculate a composite \$/mile value for city driving using the following equation:

$$\$/\text{mile} = \$/\text{mile}_{\text{CD}} \times \text{UF} + \$/\text{mile}_{\text{CS}} \times (1 - \text{UF})$$

(vi) Repeat the calculation in paragraph (e)(3)(v) of this section for highway driving.

(vii) Calculate the annual fuel cost based the combined values for city and highway driving using the following equation:

$$\text{Annual fuel cost} = (\$/\text{mile}_{\text{city}} \times 0.55 + \$/\text{mile}_{\text{hwy}} \times 0.45) \times \text{Average Annual Miles}$$

(f) *Fuel savings.* Calculate an estimated five-year cost increment relative to an average vehicle by multiplying the annual fuel cost from paragraph (e) of this section by 5 and subtracting this value from the average five-year fuel cost. We will calculate the average five-year fuel cost from the annual fuel cost equation in paragraph (e) of this section based on a gasoline-fueled vehicle with a mean fuel economy value, consistent with the value dividing the 5 and 6 ratings under paragraph (d) of this section. The average five-year fuel cost for model year 2012 is \$12,600 for a 22-mpg vehicle that drives 15,000 miles per year with gasoline priced at \$3.70 per gallon. We may periodically update this five year reference fuel cost for later model years

to better characterize the fuel economy for an average vehicle. Round the calculated five-year cost increment to the nearest \$50. Negative values represent a cost increase compared to the average vehicle.

(g) *Smog rating.* Establish a rating for exhaust emissions other than CO<sub>2</sub> based on the applicable emission standards as shown in Table 2 of this section. For Independent Commercial Importers that import vehicles not subject to Tier 2 emission standards, the vehicle's smog rating is 1. If EPA or California emission standards change in the future, we may revise the emission levels corresponding to each rating for future model years as appropriate to reflect the changed standards. If this occurs, we would publish the revised ratings as described in § 600.302-12(k), allowing sufficient lead time to make the changes; we would also expect to initiate a rulemaking to update the smog rating in the regulation.

TABLE 1 TO § 600.311-12—CRITERIA FOR ESTABLISHING SMOG RATING

Rating	U.S. EPA Tier 2 emission standard	California Air Resources Board LEV II emission standard
1 .....	— .....	ULEV &LEV II large trucks
2 .....	Bin 8 .....	SULEV II large trucks
3 .....	Bin 7 .....	—
4 .....	Bin 6 .....	LEV II, option 1
5 .....	Bin 5 .....	LEV II
6 .....	Bin 4 .....	ULEV II
7 .....	Bin 3 .....	—
8 .....	Bin 2 .....	SULEV II
9 .....	— .....	PZEV
10 .....	Bin 1 .....	ZEV

(h) *Ranges of fuel economy and CO<sub>2</sub> emission values.* We will determine the range of combined fuel economy and CO<sub>2</sub> emission values for each vehicle class identified in § 600.315. We will generally update these range values before the start of each model year based on the lowest and highest values within each vehicle class. We will also use this same information to establish a range of fuel economy values for all vehicles. Continue to use the most recently published numbers until we update them, even if you start a new model year before we publish the range values for the new model year.

(i) [Reserved]

(j) *Driving range.* Determine the driving range for certain vehicles as follows:

(1) For vehicles operating on non-pressurized liquid fuels, determine the vehicle's driving range in miles by multiplying the combined fuel economy described in paragraph (a) of this section by the vehicle's usable fuel storage capacity, rounded to the nearest whole number.

(2) For electric vehicles, determine the vehicle's overall driving range as described in Section 8 of SAE J1634 (incorporated by reference in §600.011), as described in §600.116. Determine separate range values for FTP-based city and HFET-based highway driving, then calculate a combined value by arithmetically averaging the two values, weighted 0.55 and 0.45 respectively, and rounding to the nearest whole number.

(3) For natural gas vehicles, determine the vehicle's driving range in miles by multiplying the combined fuel economy described in paragraph (a) of this section by the vehicle's usable fuel storage capacity (expressed in gasoline gallon equivalents), rounded to the nearest whole number.

(4) For plug-in hybrid electric vehicles, determine the battery driving range and overall driving range as described in SAE J1711 (incorporated by reference in §600.011), as described in §600.116, as follows:

(i) Determine the vehicle's Actual Charge-Depleting Range,  $R_{cda}$ . Determine separate range values for FTP-based city and HFET-based highway driving, then calculate a combined value by arithmetically averaging the two values, weighted 0.55 and 0.45 respectively, and rounding to the nearest whole number. Precondition the vehicle as needed to minimize engine operation for consuming stored fuel vapors in evaporative canisters; for example, you may purge the evaporative canister or time a refueling event to avoid engine starting related to purging the canister. For vehicles that use combined power from the battery and the engine before the battery is fully discharged, also use this procedure to establish an all electric range by determining the distance the vehicle drives before the engine starts, rounded to the

nearest mile. You may represent this as a range of values. We may approve adjustments to these procedures if they are necessary to properly characterize a vehicle's all electric range.

(ii) Use good engineering judgment to calculate the vehicle's operating distance before the fuel tank is empty when starting with a full fuel tank and a fully charged battery, consistent with the procedure and calculation specified in this paragraph (j), rounded to the nearest 10 miles.

(5) For hydrogen fuel cell vehicles, determine the vehicle's driving range in miles by multiplying the combined fuel economy described in paragraph (a) of this section by the vehicle's usable fuel storage capacity (expressed in kilograms of hydrogen), rounded to the nearest whole number.

(k) *Charge time.* For electric vehicles, determine the time it takes to fully charge the battery from a 240 volt power source to the point that the battery meets the manufacturer's end-of-charge criteria, consistent with the procedures specified in SAE J1634 (incorporated by reference in §600.011) for electric vehicles and in SAE J1711 (incorporated by reference in §600.011) for plug-in hybrid electric vehicles, as described in §600.116. This value may be more or less than the 12-hour minimum charging time specified for testing. You must alternatively specify the charge time based on a standard 120 volt power source if the vehicle cannot be charged at the higher voltage.

(1) *California-specific values.* If the Administrator determines that automobiles intended for sale in California are likely to exhibit significant differences in fuel economy or other label values from those intended for sale in other states, the Administrator will compute separate values for each class of automobiles for California and for the other states.

[76 FR 39563, July 6, 2011, as amended at 76 FR 57380, Sept. 15, 2011]

**§ 600.312-08 Labeling, reporting, and recordkeeping; Administrator reviews.**

(a)(1) The manufacturer shall determine label values (general and specific) using the procedures specified in subparts C and D of this part and submit